TWO MAPS IN AN EARLY TREATISE ON EPIDEMIOLOGY

(CAGNATI, 1599)

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HISTORIANS of cartography continue to recognize that early maps which portray any aspect of disease are extremely rare. Indeed, it is understood that maps which display the actual location of cases or the areal distribution of maladies did not begin to appear before the very end of the 18th century and were not frequent before the first and second decades of the 19th.[1] A series of earlier maps, dated from 1514 to 1732, was judged to present, not the history of medical cartography but its *prehistory,* in the sense that the cartographers or draughtsmen limited their attention to some feature which was believed to be related to disease, e.g., drainage or quarantine. One of the most elaborate, a map published in 1717 by the papal physician Giovanni Maria Lancisi (1654–1720), shows the terrain, the drainage, and the winds in and near the city of Rome,[2] and thereby embodied the concepts that had been set forth ca 400–430 B.C. in the Hippocratic treatise *Airs, Waters, Places.*[3]

The two maps that are now to be considered were published in a discussion of a single element in the causation of disease, viz., the atmosphere. The maps appear in *De Romani Aeris Salubritate* (On the Healthfulness of the Atmosphere of Rome),[4] a book written by Marsilio Cagnati (1543–1612) and published in Rome in 1599.

Cagnati was born in Verona in 1543 and received his doctorate at Padua about 1565. After practicing medicine with distinction in his native city, he became professor at the University of Rome *(La Sapienza)* and director of the famous Ospedale di Santo Spirito in Sassia. His writings on clinical medicine and epidemiology show him to have been a man of great learning. The trusted physician of eminent personages, he was consultant to the Jesuit order and was regarded highly by the Roman Curia and by Pope Clement VIII (Ippolito Aldobrandini), who reigned from 1592 to 1605.[5] Cagnati's book is dedicated to Cardinal Pietro Aldobrandini, the pope's nephew and papal secretary of state. The Aldobrandini arms adorn the title-page of the book. The combination of an interest in epidemiology and in Roman religious and

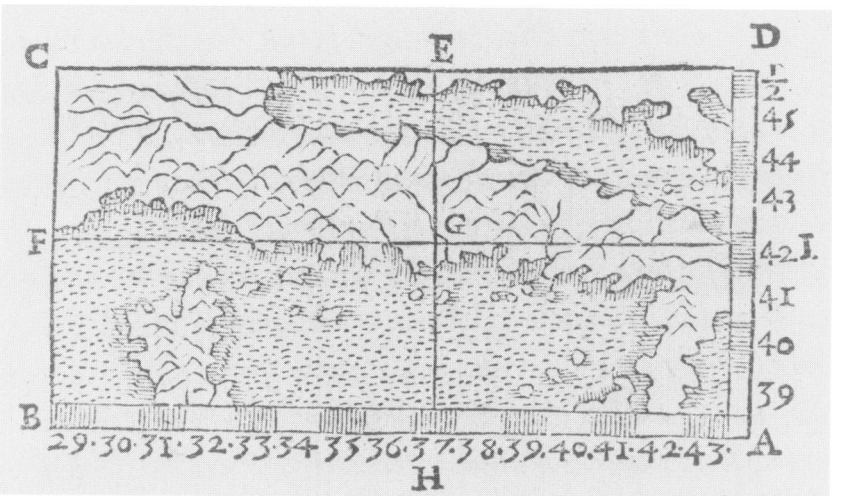

Fig. 1. Woodcut map designed to show that Rome is in the center of Italy (Cagnati, 1599, p. 16). The original measures 83 x 41 mm. Ptolemaic latitudes and longitudes are indicated. Courtesy of National Library of Medicine.

academic affairs makes it almost inevitable that Cagnati should have written the treatise which is here under discussion.

The text, replete with references to the ancient and modern literature (especially the former), is a tortuous attempt to show that the atmosphere of Rome is not unhealthful, although Galen had pointed out the frequency of catarrh in that city. In Cagnati's opinion (p. 9)[6], the high prevalence of catarrh is due to the fact that Roman air is excessively moist, thick, foggy, warm and southerly; moreover, pestilence is the offspring of heat and abundant moisture. It is therefore not surprising that the city has suffered 22 outbreaks of pestilence in 200 years. The logic is not impeccable.

The air in Rome, Cagnati continues (p. 11), is moist, coarse and dense since the city is surrounded by hills; thus, it is comparable to an amphitheater. Conditions in the hills are no better, and the unhealthfulness of the Vatican district is notorious. Further, the weather is dangerously variable.

The site of Rome, he says (p. 15), is not well described unless it is compared with the entire world. Astronomers have determined that the city is 36½ degrees east of the Fortunate (Canary) Islands and about 42 degrees north of the equator. It is in the central part of Italy according to both latitude and longitude. But since it is nearer the "Mediterranean" (Tyrrhenian) sea than it is to the Adriatic, there is a difficulty about its true centrality.

The problem is resolved if we consider at the same time all of Italy and the adjacent parts of the sea. The anonymous map in Figure 1 shows these

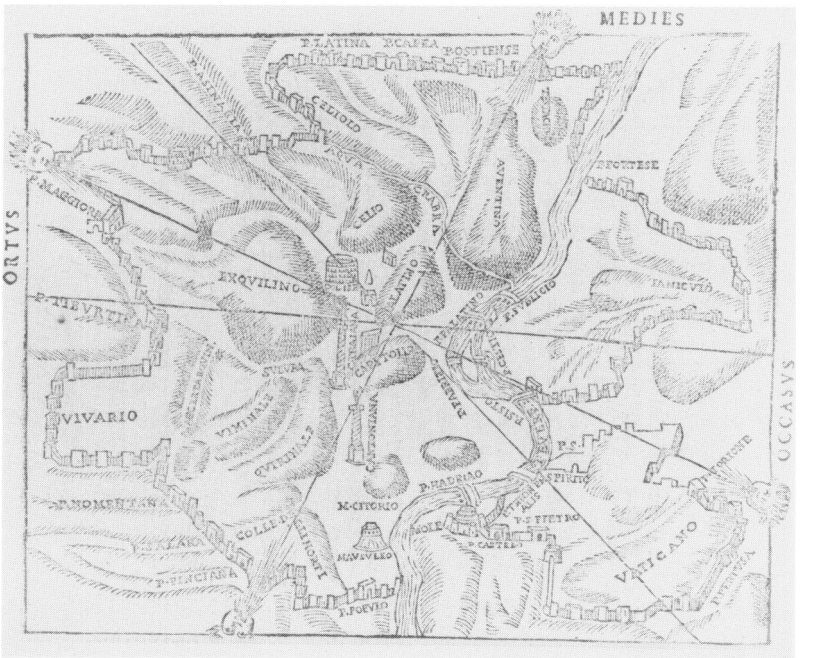

Fig. 2. Woodcut map of Rome designed to show the hills and the winds (Cagnati, 1599, p. 55). The original measures 131 x 169 mm. Southeast is at the top. Courtesy of National Library of Medicine.

regions enclosed in a rectangle. The border that appears at the reader's right as the line AD is a meridian between that of Capo dell' Armi (15°40′E) and Capo S. Maria di Leuca (18°23′E); this line is at 43 Ptolemaic degrees on Cagnati's map. Parallel to it is the line BC, that passes through the river Var (44°N, 6°45′E), which was the boundary between Italy proper and the province of Narbonne. This line ascends to the point C, which is approximately at Trento (46°4′N, 11°8′E).

The line EH is drawn at Ptolemaic longitude 36½° and the line FI at Ptolemaic latitude 42½°N. These two cross at G, which is the site of Rome, recorded nowadays at 41°53′N and 12° 30′E.

The horizontal line FI bisects the quadrangle exactly, showing that Rome is centrally located with respect to latitude. The bisection produced by the vertical line EH is less exact.

What is to be made of this centrality? Rome, says Cagnati (p. 17), is at the middle of the very temperate fifth *clima* or region, in which the longest day and the longest night last 15 hours. It is situated in the place most suited

for rule over all of Italy, just as the whole body is governed by the centrally situated heart (through the power of the soul), and the inhabitants of Rome are endowed with the temperament best suited for governance.

In returning to the subject of health, Cagnati points out, interestingly (p. 26), that Alexandria is healthful despite the presence of swamps. Rome, moreover, is much healthier than formerly (p. 29), in part because of improvements in architecture and ventilation. In the 16th century (p. 32) there were more than 70 nonpestilential years. The occurrence of seven pestilences (p. 33) between 1568 and 1591 does not prove that Roman air is truly pestilential, since other causes were present from time to time.

By these and other complex ratiocinations Cagnati concludes (pp. 41 sqq.) that diseases which are common at Rome are not attributable to the air. Moreover, Rome is ventilated on all sides, admitting cold and dry winds as well as warm and moist ones. Any coarse dense vapors are removed by the sun, which shines all day long, and by the winds, which blow in all directions.

Cagnati's treatise ends appropriately with the map reproduced as Figure 2. The source is unstated. The woodcut design measures 131x169 mm. in the original and has a scale of approximately 1:18,500,000. Southeast is at the top. The four major directions are given in Latin, MERIDIES being misspelled MEDIES. The principal hills, the Tiber, the bridges, and the walls, gate and a few of the major monuments are shown; these are named in Italian. Superimposed on this display are eight winds, represented by long lines which cross at the Forum.

As I have stated above, neither of these two charming maps shows the distribution of any disease or the location of any cases of disease, thematic cartography being two hundred years in the future. Instead, the maps are explanatory intercalations in the somewhat intricate text.

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